REMARKS

By this Amendment, Claims 1 through 30 are amended. Claim 31 is cancelled. Claim 32 is added As such, Claims 1-30 and 32 are pending herein. No new matter is added by this Amendment.

Support for the Amendment to Claim 1 may be found at least in Paragraphs [0031] and [0034].

Support for the Amendment to Claim 2 may be found at least in Paragraph [0052].

Support for the Amendments to Claims 4 and 5 may be found at least in Paragraph [0037].

Support for the Amendment to Claim 8 may be found at least in Paragraph [0078].

Support for the Amendment to Claim 9 may be found at least in Paragraph [0047].

Support for the Amendment to Claim 12 may be found at least in Paragraph [0074].

Support for the Amendment to Claim 15 may be found at least in Paragraphs [0067] and [0071].

Support for the Amendments to Claims 16 and 17 may be found at least in Paragraph [0032].

Support for the Amendment to Claim 20 may be found at least in Paragraph [0079].

Support for the Amendments to Claims 22 and 23 may be found at least in Paragraph [0044].

Support for the Amendment to Claim 24 may be found at least in Paragraph [0064].

Support for the Amendment to Claim 26 may be found at least in Paragraph [0064].

Support for the Amendment to Claim 28 may be found at least in Paragraph [0081].

Amendments to the Drawings.

The attached sheet of drawings includes changes to Figure 12. In Figure 12, previously omitted reference character 106 for the "ribs" has been added.

I. Drawing Objections

The drawings were objected to for failing to comply with 37 CFR 1.84(p)(4), the Patent Office stating: "because reference character "25" has been used to designate both over inflation sensor and reed switch (see page 13)." This objection is respectfully traversed.

By this Amendment, appropriate correction is made in Paragraph [0051]. Reconsideration and withdrawal of the objection are respectfully requested.

The drawings were further objected to under 37 CFR 1.83(a) "because they failed to show reference character (106) as described in the Specifications (page 22)." The objection is respectfully traversed.

By this Amendment, appropriate correction is made in Figure 12. Reconsideration and withdrawal of the objection are respectfully requested.

II. Claim Rejection Under 35 USC §102 (b)

Claims 1-3, 7-8, 15, 18, 19, 22, 23, and 24-31 were rejected under 35 USC §102(b) as allegedly being anticipated by United States Patent No. 5,473,313 to Graebe. The rejection is respectfully traversed.

The Patent Office alleges that Graebe teaches each and every element of Claims 1-3, 7-8, 15, 18, 19, 22, 23, and 24-31. Applicant respectfully disagrees for the following reasons:

Graebe focuses on a manual system in which a caregiver is requires to pump and deflate the air cushion to prevent the seated individual from bottoming out. In particular, at Column 3, lines 21-27, Graebe describes a manual air pump **40** and release valve **62** for inflating and deflating cushion **34**.

Although Graebe mentions the use of a circuit board **74**, it is impossible for the circuit board **74** of Graebe to teach or suggest the microprocessor of Claim 1, which adjusts the immersion depth. The circuit board **74** of Graebe fails to teach or suggest the microprocessor recited in Claim 1 which is "controlling the air pump and the air valve," "monitoring the bottom out sensor and the over inflation sensor," to "adjust a depth of immersion of an individual into the air cushion" of the immersion control system of the present invention. These functions of "controlling," "monitoring," and "to adjust a depth of immersion" are simply not taught or suggested by Graebe.

Moreover, Graebe does not teach or suggest the continual adjustment provided by the microprocessor of Claim 1. A person seated in the system of the present invention will move, shift or adjust their weight. An individual seated in any chair will not remain sitting still in one fixed position. As an individual is seated on the system, the present invention provides a dynamic microprocessor controlled air cushion immersion control system that continuously monitors and continuously adjusts the immersion of the individual seated in the air cushion. A conventional air cushion will not accommodate and automatically adjust to these fluctuations in position, nor will the system described in Graebe. However, the microprocessor control of the present invention continually monitors and adjusts the immersion depth of the individual seated on the air cushion. As recited in Paragraph [0032] in the present Application, microprocessor provides several important functions and advantages to the air cushion immersion control system:

> The microprocessor times how long a user can be bottomed-out in the air cushion before an alarm will sound. The microprocessor manages a battery saver system that automatically measures how much time will be allowed before the adjustment sequence is

> completed. The microprocessor allows the air pump to continue operation for a defined period of time after the individual is raised off the bottom-out sensors.

These advantages provided by the microprocessor are not taught or suggested by Graebe.

Moreover, the microprocessor control reduces the need for hospital technicians or nurses' aides to constantly monitor the person seated in the air cushion. The person seated into the air cushion may not have feeling in their lower extremities and may not realize that they have bottomed out into the air cushion and are at risk forming bedsores. The present invention automatically adjusts the inflation and immersion levels for a person using the air cushion to reduce the occurrence of bedsores and decubitus ulcers. As discussed in [0030] of the present Application:

> The system also readjusts the seat surface when the user bottoms-out from a shift in seating position by the user. For example, the user may cross their legs, changing the support resulting in a bottom-out. The system will recognize each shift in seating position if they result in a bottom-out of the user, and will subsequently readjust the seating surface to reduce or stop the bottom-out. If over inflation results from various position changes, the system will remove air to maintain the user deeply immersed in the air cushion.

Graebe fails to teach or suggest a microprocessor monitoring and controlling immersion depth. For at least this reason, Applicant respectfully submits that Graebe fails to teach or suggest the present invention. Reconsideration and withdrawal of the rejection are respectfully requested.

With respect to Claim 7, Graebe fails to teach or suggest "the microprocessor controls the air pump to continue to operate for a designated period of time after the bottom-out sensors are

no longer activated." As discussed above, Graebe fails to teach or suggest the use of a microprocessor to control and monitor the air cushion control system. Paragraph 40 of the present Application describes the advantages of this claimed feature: "This allows the air pump time to add a short amount of extra inflation and to help assure that the strips of the sensor board are no longer touching the bottom-out sensors. This minimizes the contact between the strips and bottom-out sensors and reduces the use of the air pump, thereby conserving battery power." Applicant respectfully suggests that Graebe fails to teach or suggest this feature of Claim 7, and therefore, the rejection under 102(b) must be withdrawn.

With respect to Claim 15, Graebe fails to teach or suggest an "adjustment button that when activated signals the microprocessor to open the air valve." Instead, Graebe discusses a manual air pump **40** and release valve **62** for inflating and deflating cushion **34**. Graebe fails to teach or suggest activating a microprocessor via an adjustment button. Applicant respectfully suggests that Graebe fails to teach or suggest this feature of Claim 15, and therefore, the rejection under 102(b) must be withdrawn.

With respect to Claim 18, Graebe fails to teach or suggest that "the microprocessor closes the air valve of the air cushion immersion control system after a programmed time delay." This feature prevents the unintentional activation resulting in dead batteries. Applicant respectfully suggests that Graebe fails to teach or suggest this feature of Claim 18.

With respect to Claim 19, Graebe fails to teach or suggest a microprocessor closing the air valve in an adjustment process that is activated by an increase in internal pressure in the air chamber sensor due to increased temperature, pressure, or altitude. This feature prevents the unintentional activation resulting in dead batteries. Applicant respectfully suggests that Graebe

fails to teach or suggest this feature of Claim 19, and therefore, the rejection under 102(b) must be withdrawn.

With respect to Claims 22 and 23, Graebe fails to teach or suggest an air cushion immersion control system that automatically recognizes an occupant. Again, Graebe requires manual assistance to commence the adjustment procedure. Applicant respectfully suggests that Graebe fails to teach or suggest this feature, and therefore, the rejection under 102(b) must be withdrawn.

With respect to Claims 24-27, Graebe fails to teach or suggest an air chamber sensor having the requirement of Claim 24, "wherein the distance from an edge of the air chamber sensor to the end of the channel wall does not exceed one-half the distance between the channel walls." As discussed in Paragraph [0053] of the present Application, a spacing of the channel walls **26** within the air chamber sensor **20** provides stability to help govern and regulate the air flow and help control immersion in the air cushion **10** and reactive timing for adjustment. Applicant respectfully suggests that Graebe fails to teach or suggest this feature of Claim 24, and therefore, the rejection under 102(b) must be withdrawn.

With respect to Claims 28-30, Applicant does not understand the Patent Office's rejection. There is absolutely no discussion, teaching or suggestion in Graebe to include the "support strips" of Claim 28 in the air chamber of the air chamber sensor. These internal "support strips" provide significant advantages. As discussed in Claim 30, the support strips "reduce the bleeding of air from the air chamber sensor back into the air cushion when the air cushion is unoccupied" and serve as an activation and regulator means for immersion

adjustment. As such Applicant respectfully suggests that Graebe fails to teach or suggest each and every element of Claims 28-30.

III. Claim Rejections Under 35 USC §103 (a).

A. Graebe in view of Ford or Iskra.

Claims 4-5, 16, 17, 20, and 21 were rejected under 35 USC §103(a) as allegedly being unpatentable over Graebe in view of United States Patent No. 4,711,275 to Ford or United States Patent No. 5,487,197 to Iskra. This rejection is respectfully traversed

The Patent Office alleges that Ford "teaches measuring a time period when a cushion is in a bottomed-out condition before sounding an alarm." Applicant respectfully disagrees with this interpretation of Ford.

Applicant notes Column 4, Lines 9, 15-19 of Ford: "If the mattress pressure should fall below a preset level, this is detected by pressure switch **4**, labeled "H," which signals to the CPU **6** to turn on the spare compressor to restore the correct mattress pressure." Applicant notes that Ford is measuring air pressures, unlike the present invention, which is monitoring the depth of immersion. In Ford, the pressures are set by a nurse, hospital technician, or the like. This setting of the pressure in the system of Ford is a subjective measurement determined by others and fails to teach or suggest the present invention. As discussed above, Ford and Iskra describe measuring internal pressure. The system of the present application measures immersion into the cushion, which is a more reliable measurement of sitting pressure. Allowing the cushion to conform to the individual's shape and immersing the individual as far as possible into the cushion without bottoming out provides for the cushion to contact as much surface area of the individual as possible, and thus distributing the weight of the individual to minimize skin

pressures. An individual seated does not provide a constant and uniform downward force. In reality, a seated individual applies a range of forces to the seating surface in a range of different locations. A cushion system based on pressure does not adequately prevent or determine bottoming out. The present invention provides a system where the immersion depth is constantly monitored and adjusted so that a bottom-out or an over inflation will not occur. As described in Ford, at Column 4, lines 30-43, the alarm system is based on a low reading of pressure, and is not based on a bottom out sensor that has been contacted.

As such, Applicant respectfully suggests that Graebe in view of Ford fails to teach or suggest the present invention.

The Patent Office next combines Iskra with Graebe. Again, Iskra describes measuring internal air pressure of the instant upper and lower pressure set point. See, for example, Column 4, Line 41-54 of Iskra:

> To adjust the inflation pressure of air cushion **12**, the potentiometer is adjusted so that the upper set point is such that the air cushion will inflate firm and then a user should be positioned on the air cushion...as the potentiometer is slowly adjusted, lowering the upper set point, the user will gradually sink into air cushion **12**. Adjustment of the potentiometer should continue, lowering the upper set point, until the user nearly bottoms-out when he leans from side to side... As the upper set point is adjusted, controller **72** sets the lower set point at a level sufficient to keep the patient from bottoming-out...

And for the reasons discussed above with respect to Ford, Applicant respectfully suggests that Graebe in view of Iskra fails to teach or suggest the present invention. As discussed above, measuring air pressure is not a safe or accurate way to measure immersion depth. When an individual is seated on an air cushion, the individual does not place a constant, even force onto the air cushion. Thus, it is not possible for a cushion at a specific pressure to prevent bottoming-

out. The individual will move or shift resulting in localized areas where the individual is bottoming-out. In the Ford and Iskra systems, there is no physical sensor means to determine bottom-out. Thus, the present invention adjusts immersion depth and is not concerned with measuring pressure in the air sensor chamber to provide proper immersion.

With respect to Claim 4, Iskra and Ford fail to teach or suggest performing a timing sequence that measures a duration that the air cushion is in a bottom-out condition or over inflation condition without an audible alarm or visual alarm being activated. Ford is measuring a time period of low pressure, and is not measuring immersion depth. Moreover, Ford is not measuring over inflation, as recited in Claim 4. Iskra likewise is measuring pressure.

With respect to Claim 5, Iskra and Ford fail to teach or suggest activating an alarm when a bottom-out or over inflation conditions persist beyond a programmed time period.

With respect to Claims 16 and 17, Ford and Iskra fail to teach or suggest to manage a battery saver system that closes the air valve and deactivates the air cushion immersion control system if the adjustment button is activated without an occupant on a seat cushion connected to the air cushion immersion control system. Ford and Iskra simply fail to teach or suggest this feature.

Graebe in view of Ford or Iskra fails to teach or suggest Claims 4-5, 16, 17, 20, and 21, as Ford and Iskra fail to measure immersion. Instead the references describe measuring internal pressure. Reconsideration and withdrawal of the rejection are respectfully requested.

B. Graebe in view of Vaughn or Iskra.

Claims 6-9 were rejected under 35 USC §103 (a) as allegedly being unpatentable over Graebe in view of United States Patent No. 5,657,499 (Vaughn) or Iskra. This rejection is respectfully traversed.

As stated in Column 3, Lines 53-62 of Vaughn:

"The pressure level in each bladder is controlled by pressure relief valve **26** which can be pre-selected to open at prescribed pressure levels." As extensively discussed above, measuring air pressure is not a safe or accurate way to measure immersion depth.

With respect to Claim 6, Vaughn and Iskra fail to teach or suggest a battery saver system that prevents the rundown of the batteries if an adjustment button is inadvertently activated. This is an important feature since if the air cushion immersion control system is inadvertently activated, the air valve will remain open continually as the bottom-out sensors will not be activated and the batteries will be drained. Reconsideration and withdrawal of the rejection are respectfully requested.

With respect to Claim 7, Vaughn and Iskra fail to teach or suggest to control the air pump to continue to operate for a designated period of time after the bottom out sensors are no longer activated.

With respect to Claim 8, Vaughn and Iskra fail to teach or suggest an interchangeable lower housing.

Graebe in view of Vaugh or Iskra fails to teach or suggest Claims 6-9. Reconsideration and withdrawal of the rejection are respectfully requested.

C. In view of Graebe.

Claims 10-14 were rejected under 35 USC §103 (a) as allegedly being unpatentable over Graebe. This rejection is respectfully traversed. Graebe fails to teach or suggest all limitations of Claims 1 and 2 as discussed above. With respect to Claim 12, for the sake of safety, it is important that the audible alarm provides back-up for the silent led system. This feature is not taught or suggested by Graebe. For at least these reasons, Graebe fails to teach or suggest Claims 10-14. Reconsideration and withdrawal of the rejection are respectfully requested.

IV. Conclusion.

Applicant respectfully submits that the present Application is in condition for allowance. The Patent Office is invited to contact the undersigned with any questions with respect to the present Application.

Respectfully submitted,

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Attachments